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from those in Porto Rico, as a station for experiments in sugar production has been maintained by private beneficence for a number of years. In connection with his investigation of the location of a station, Dr. Stubbs will consider the feasibility of combining the Federal station with the Hawaiian Experiment Station or the agricultural department of the Kamehameha Manual Training School at Honolulu. Here also the lines in which investigation is most needed, the possibility of greater diversification of the agriculture, the expense of inaugurating and maintaining experiment station work, and the means of disseminating information among the people will be carefully inquired into. This will probably prove a profitable field for investigations on the use and economy of water in irrigation, since according to reports received from authentic sources, in no other place is so much money expended for pumping water for irrigation. Some of the pumps are said to be raising 30,000,000 gallons of water per day from a depth of 500 feet, using coal that costs \$10 a ton. The expense of irrigating in some cases reaches as high as \$125 per acre annually.

#### SCIENTIFIC NOTES AND NEWS.

THE attendance at the Bradford meeting of the British Association was 1,915 distributed as follows: Old life members, 267; new life members, 13; old annual members, 297; new annual members, 45; associates, 801; ladies, 483; foreign members, 9. The British Association is fortunate in always arousing local interest and securing a large number of associates. It will be noted, however, that the attendance of members at Bradford—622—was not greatly in excess of the attendance at meetings of the American Association, although American men of science are scattered over a much wider area and undergo greater inconvenience in coming together in mid-summer.

THE grants appropriated for scientific purposes amounted to £945 and were distributed as follows: Mathematics and Physics—electrical standards (balance in hand), and £45; seismological observations, £75; magnetic force on board ship, £10. Chemistry—relation be-

tween absorption spectra and constitution of organic substances (balance, £6 8s. 9d. in hand); wave length tables, £5; isomorphous sulphonic derivatives of benzene, \$35. Geology—erratic blocks (£6 in hand); photographs of geological interest (balance, £10 in hand); ossiferous caves at Uphill (renewed), £5; underground water of Northwest Yorkshire, £50; exploration of Irish caves (renewed), £15; life-zones in British carboniferous rocks, £20. Zoology—table at the Zoological Station, Naples, £100; table at the Biological Laboratory, Plymouth, £20; index generum et specierum animalium, £75; migration of birds, £10. Geography—terrestrial surface waves, £5; changes of land-level in the Phlegrean fields, £50. Economic Science and Statistics—state monopolies in other countries (£13 13s. 6d. in hand); legislation regulating women's labor, £15. Mechanical Science—small screw gauge (balance in hand) and £45; resistance of road vehicles to traction, £75. Anthropology—Silchester excavation, £10; ethnological survey of Canada, £30; age of stone circles (balance in hand); photographs of anthropological interest (balance of £10 in hand); anthropological teaching, £5; exploration in Crete, £145. Physiology—physiological effects of peptone, £30; chemistry of bone marrow, £15; suprarenal capsules in the rabbit, £5. Botany—fertilization in phaeophyceæ, £15; morphology, ecology and taxonomy of podostemaceæ, £20. Corresponding societies—preparation of report, £15.

ONE of the most important actions taken at Bradford was a reference to the Council with a favorable recommendation of a plan for the establishment of a section of education which should deal not only with scientific education, but with education as a science. The report of the treasurer showed receipts of over \$11,000, but the expenses of the year exceeded the receipts by about \$4,000. This deficit was due to the fact that the Dover meeting last year was rather small, while the grants were as large as usual and there were some extra expenses in connection with the visit of the French Association. The items of expenditure were in round numbers \$5,000 for printing, \$2,500 for salaries, \$2,000 for the expenses of the Dover meeting and \$5,000 for scientific grants. In re-

ceipts and in the amount annually granted for scientific research the American compares unfavorably with the British Association. The difference is explained by the large number of local associates. If the 'ladies' noted above are all associates the local contribution to the funds of the Association at Bradford amounted to over \$6,000.

DR. W J MCGEE, ethnologist in charge of the Bureau of American Ethnology, has undertaken an expedition to southwestern Arizona and Sonora, for the purpose of continuing researches among the Papago Indians and extending the studies to the practically unknown Tepoka tribe, supposed to inhabit the eastern shore of the Gulf of California, midway between the mouth of Colorado river and Tiburon island. Not a word of the Tepoka language has ever been recorded, and not a single specimen of their handicraft is in any museum.

MM. CHAUVEAU and Cornu have been designated by the Paris Academy of Sciences as delegates to the International Commission on Physiological Instruments, of which M. Marey is the president.

M. YERSIN, to whom the Paris Academy of Moral Sciences recently awarded a prize of 15,000*f.* for philanthropic acts, has devoted the sum to his anti-plague serum establishment at Nha-trang.

SIR MICHAEL FOSTER has returned to England after having given a series of lectures before the Cooper Medical College, San Francisco. He was unable to be at Bradford as retiring president of the British Association.

Dr. W. L. BRYAN, professor of philosophy in the University of Indiana and vice-president, attended the recent International Congress of Psychology at Paris and will remain abroad during the present year.

J. G. HIBBEN, professor of logic in Princeton University, is spending the year abroad and is at present in Strasburg.

PROFESSOR GEORGE T. LADD, who holds the chair of philosophy at Yale University, has returned to the United States after a year's absence spent chiefly in Japan and India, where by special invitation he delivered lectures on

philosophy and education at a number of the leading universities.

THE Duke of Abruzzi, returning from his Arctic expedition, reached Naples on September 17th, and was met at the station by the King of Italy. He was welcomed with much enthusiasm. The London *Daily Express* states, on what authority we do not know, that the Duke of Abruzzi and Nansen will join in a North Polar expedition.

DR. ALFRED STILLÉ, formerly professor of the theory and practice of medicine at the University of Pennsylvania, has died at the age of eighty-seven years. He was the author of numerous works on medicine.

PROFESSOR JOHANN KJELDAHL, director of the chemical and physiological laboratory, Alt Karlsberg, near Copenhagen, was drowned recently while trying to save the life of a child. He is known for the method of detecting nitrogen to which his name has been attached.

THE death is announced at the age of seventy-three years of Dr. Friedrich Griepenkerl, professor of agriculture in the University of Göttingen.

DR. A. GRAHAM BELL in his address as president to the Board of Managers of The National Geographic Society referred to the desirability of securing for the Society a building in Washington in which to establish the national headquarters. Mr. Bell stated that the plans for the proposed Memorial Building to the late president, Hon. Gardiner Greene Hubbard, are gradually taking form and assuming a practicable phase, and it is not unlikely that a Memorial Building may be erected this year and offered for the use of the Society. It is proposed that the building should contain a few small rooms that could be used as offices, a library and map-room, and a hall or meeting place sufficiently large to seat about 100 people. This would accommodate the Board of Managers and committees of the Society, and also permit of small scientific meetings of the Fellows of the Society. The Memorial Building, if erected, will place the Society in a much better position to receive the International Congress of Geographers, which has been invited to assemble in Washington under its aus-

pices. Everything seems favorable to the establishment of the Society upon a permanent basis, and it only remains to take the necessary steps to convert the Society into a really national organization with national representation.

THE seventy-second Congress of German Men of Science and Physicians, as we have already announced, met on September 17th at Aix-la-Chapelle. The Congress, as we learn from the *British Medical Journal*, contains 38 Sections; 17 are devoted to more or less non-medical subjects, such as natural history, geology, geography, education, etc., the remaining 21 dealing with all the special subjects of medicine, including balneology, accidents, history of medicine and medical geography, and finally veterinary matters. Several large buildings are devoted to the business of the sections, and there is a strong muster of about 2,000 German-speaking scientists, including many whose names are well known outside their respective countries. At the opening meeting the usual speeches of welcome were delivered by the Mayor and others, and the introductory addresses this year were by arrangement devoted not only to giving a retrospect of the subject, but a sketch of its development during the nineteenth century. Dr. J. H. van't Hoff (Berlin) spoke on the 'Development of the Exact Natural Sciences' (natural history, chemistry, and allied subjects). Dr. G. Hertwig (Berlin) delivered an address on the 'Evolution of Biology,' in which, after relating anatomical discoveries, he came to the large question of the natural origin of the organic world. He considered that Darwin's theories as to inheritance and natural selection still rested on the uncertain basis of hypothesis. He pointed out, however, that the difficulty arose from the absence of sufficient prehistoric records, and expressed his agreement with the opinion of Huxley that Darwin's teaching as to evolution will survive, apart from his principles of selection. Professor Naunyn (Strassburg) gave an address on the 'Evolution of Medicine,' connecting the progress of the science with the names of the German Schwann, the Frenchman Pasteur, and the Englishman Lister. The fourth and last address was given by Professor Chiari (Prague), whose subject was the 'Evolution of Patholog-

ical Anatomy.' As the founders of this science he mentioned Morgagni, Baillie, and the latter's pupils. The sections began their work on September 18th. An exhibition of scientific apparatus, drugs, foods, etc., was held in connection with the Congress. Some 300 to 400 papers were announced to be read, the Congress occupying five days in all.

THE annual meeting of the British Iron and Steel Institute opened in Paris on September 18th and 19th under the presidency of Sir William Roberts-Austin. In addition to the address by the president, there were ten papers on the program. It was announced that Mr. Andrew Carnegie had given to the Institute the sum of £6,500 for the purpose of founding a medal and scholarship to be awarded for any piece of work that may be done in any works or university, and to be open to either sex. The details were to be left to the council of the Institute to settle. Mr. William Whitwell has been elected president of the Institute for the next two years.

MR. ANDREW CARNEGIE has intimated to the Greenock Town Council his intention of presenting £5,000 to the town to assist in the establishment of a free public library.

THE Philosophical Faculty of the University of Göttingen has proposed the following subject for prizes on the Benecke Foundation: A critical investigation, based upon experimental research, of those complex chemical compounds, which cannot be explained upon the ordinarily received theory of valence, or can be so explained only by a forced interpretation of the theory. This investigation should take special cognizance as to how far the phenomena of molecular addition play a part in the formation of these compounds and as to whether it is possible to formulate a comprehensive theory of these complex compounds. The first prize is 3,400 Marks, and the second prize, 680 Marks. Papers in competition must be written in a modern language, and be accompanied by a sealed envelope containing the name, a motto on the outside of the envelope corresponding to the same motto on the paper. They should be sent to the Faculty of the University of Göttingen, not later than August 30, 1902.

WE learn from the *Experiment Station Record* that the Russian Government has made provision for a commissioner of agriculture for each of the twenty governments of the Empire. They will have charge of all public measures relating to agriculture and rural affairs and will exercise supervision over the local agricultural institutions maintained by the government.

THE third Pan American Medical Congress will be held at Havana from December 26th to 29th.

THE Jury of Final Appeal of the Paris Exposition has finished its work, and it appears that in all the United States has received 2204 awards; Germany, 1826; Great Britain 1724, and Russia, 1493. Germany, however, received more grand prizes than the United States—236 as compared with 215.

THE secretary of a British anti-vivisection Society has complained to the Department of State regarding the experiments by Dr. Noel Patton in which animals were deprived of food. Sir Matthew Ridley refused to prosecute the case, and was unwilling to give an opinion as to whether such experiments came within the provisions of the anti-vivisection Act.

AT the Bradford meeting of the British Association, Mr. Glazebrook, the director of the National Physical Laboratory, presented a report on the construction of practical standards for use in electrical measurements, in which it was recommended "that a particular sample of platinum wire be selected, and platinum thermometers be constructed therefrom to serve as standards for the measurement of high temperature, and that Mr. Glazebrook and Professor Callendar be requested to consider the details of the selection of wires and construction of thermometers for the above purpose." It was announced that the sub-committee had secured specimens of a sufficiently pure platinum, and that some recently constructed thermometers had been tested at the National Physical Laboratory. During the summer a very full comparison had been made of the unit of resistance coils, and that these coils had been compared with some belonging to the Board of Trade and the Imperial Reichsanstalt of Berlin,

and also with resistance tubes prepared by M. Benoit in 1885, which were in the possession of the director of the National Laboratory. Considerations of temperature had deferred the completion of these comparisons, but further observations would be made. Some advance had been made during the year with the construction of the Ampère balance. Material pecuniary assistance had been received from Sir Andrew Noble.

THE American Consul at Frankfort sends to the Department of State an abstract of an article in the *Elektrotechnische Zeitschrift* discussing the progress made in the use of single lines for telegraphing and telephoning simultaneously. After describing the Rysselberghe system of attaining this end, and fully explaining the important part played by condensers, the writer describes a modification of the system recently introduced by the Telephone Works of Hanover, which, it seems, has already been adapted to a number of large installations, including the Berlin fire-brigade service. There are fifteen brigade stations in Berlin, each of which is served by a special network of fire alarms. From these stations underground wires radiate in all directions, each wire being connected with a great number of alarm pillars. The alarms are arranged for automatic working, and to each is fitted a key for telegraphing to the station. As it is, however, a very great advantage to be able to maintain during the progress of the fire, a good connection between the alarm pillars nearest the fire and the brigade station, exhaustive trials have been made with a specially adapted telephone constructed by the above-mentioned firm, which have resulted in the general introduction of the same. To the Morse apparatus at the station a stand is attached from which a microtelephone fitted with a battery switch and a second receiver are suspended. The remaining apparatus is inclosed in a flat box and placed under the table. This box contains an induction coil, a condenser and a circuit key. As it would be expensive to equip each of the fire-alarm posts with telephone apparatus, a portable set is used, which may be attached to the posts by means of a plug and socket provided for the purpose. Such a portable set is carried by each of the brigade carts,

there being some eighty now in use. The brigades' cycles are also equipped with sets which are very compact in design. Experience with the system has shown that the switching in of the telephone apparatus in no way influences the telegraph service. During simultaneous telegraphing and telephoning a slight knocking is perceptible in the telephone, which, however, does not destroy the audibility.

#### UNIVERSITY AND EDUCATIONAL NEWS.

THE will of the late Dr. J. M. Da Costa, of Philadelphia, contains generous public bequests, including \$5,000 to the University of Pennsylvania and \$5,000 to the College of Physicians. His medical library is given to the College of Physicians and his medical museum to the Jefferson Medical College.

MR. F. RAVENSCROFT has given 2,000 guineas to the Birbeck Institution, London. Part of the money has been used to provide a metallurgical laboratory.

THE Massachusetts Institute of Technology has established a special course in electro-chemistry which aims "to provide the education requisite for the investigation of the many new problems which the development of novel processes is certain to bring forth, and also to impart the professional skill requisite for the installation, testing, and operation of apparatus and machinery by which electrical energy is applied in chemical, metallurgical, and allied processes. The instruction given, moreover, is of such a broad character, particularly in electricity and chemistry, that a student completing this option should be well prepared to undertake various lines of electrical or chemical work other than electro-chemistry."

ON September 29th President Schurman reported a registration of 2,900 students in Cornell University. Sibley College is reported by the director to have 625 to date.

THE 'Cambridge University Calendar' shows a slight decrease in the number of students as compared with the preceding year. The following table shows the number of students at each college, etc., and also the number who have proceeded to the degree of M. A. or some

higher degree and are members of the Senate and of those who have taken their first degree :

College.	Members of the Senate.	B. A., LL.B., etc.	Under- gradu- ates.	Total.
Trinity.....	2,160	839	676	3,675
St. John's.....	984	328	237	1,549
Gonville and Caius..	411	257	222	890
Pembroke.....	317	280	226	823
Emmanuel.....	364	209	177	750
Christ's.....	360	208	168	736
King's.....	312	253	143	708
Trinity Hall.....	232	184	190	606
Clare.....	276	133	185	594
Jesus.....	211	79	112	402
Corpus Christi.....	257	83	59	399
Peterhouse.....	209	72	55	336
Queens'.....	139	81	98	318
Sidney Sussex.....	133	99	72	304
St. Catharine's.....	103	70	73	246
Magdalene.....	123	41	48	212
Downing.....	98	59	52	209
Selwyn Hostel.....	57	118	84	259
Non-collegiate.....	15	47	108	170
Members of Senate not on college boards.....	202	0	0	202
	6,963	3,440	2,985	13,388

AT Princeton University Elmer H. Loomis has been made full professor of physics and E. O. Lovett full professor of mathematics. Professor Lovett is spending the year abroad.

FRANCIS M. THORPE, instructor in the Wharton School of the University of Pennsylvania, has been called to the chair of commerce and economics in the University of Vermont, recently endowed by Mr. John H. Converse.

DR. VICTOR UHLIG, professor of mineralogy in the Technical Institute at Prague, has been appointed professor of paleontology in the University at Vienna.

A CHAIR of hygiene and bacteriology has been established in the University of Athens. Dr. Savas, formerly staff surgeon of the Greek army, has been appointed professor and director of the Hygienic Institute.

MR. L. R. WILBERFORCE, demonstrator in physics at the Cavendish Laboratory, Cambridge, and university lecturer in physics, has been appointed to the Lyon Jones chair of experimental physics at University College, Liverpool, vacated by acceptance by Dr. Oliver Lodge of the principalship of the University of Birmingham.